Cross Plots

Cross plots, or crest-to-crest relationships, are developed to help the hydrologists with their forecasts. The cross plots provide additional information as to how high a river may crest and the timing of the crest. Cross plots are developed by plotting the crest flow or stage at one location against the flow or stage at another location. The two locations must be somewhat related, they are usually on the same river, or on nearby rivers that react similarly. One location usually crests before the other. Points are plotted over many years for different events, and a relationship can be formulated by drawing a "best fit" line through the points. The difference in crest time can also be noted on the plot.

Cross plot confidence levels vary: The less scatter around the best fit line, the more confidence you can have in the cross plot. If the two points being compared are separated by a short distance, the confidence is increased, but the value of the cross plot is reduced because the lead time is so small. If a large tributary flows into the river between the two points being compared, the confidence level is reduced.

During an event, once the first river point has crested, the hydrologist can use the cross plot to get an idea of when and how high the second river point might crest. This can be a good way to check the output from a model to see if it is reasonable or not. This can also be a way to estimate a forecast in the event that the RFC is unavailable (i.e. due to a power outage, emergency evacuation, etc..)

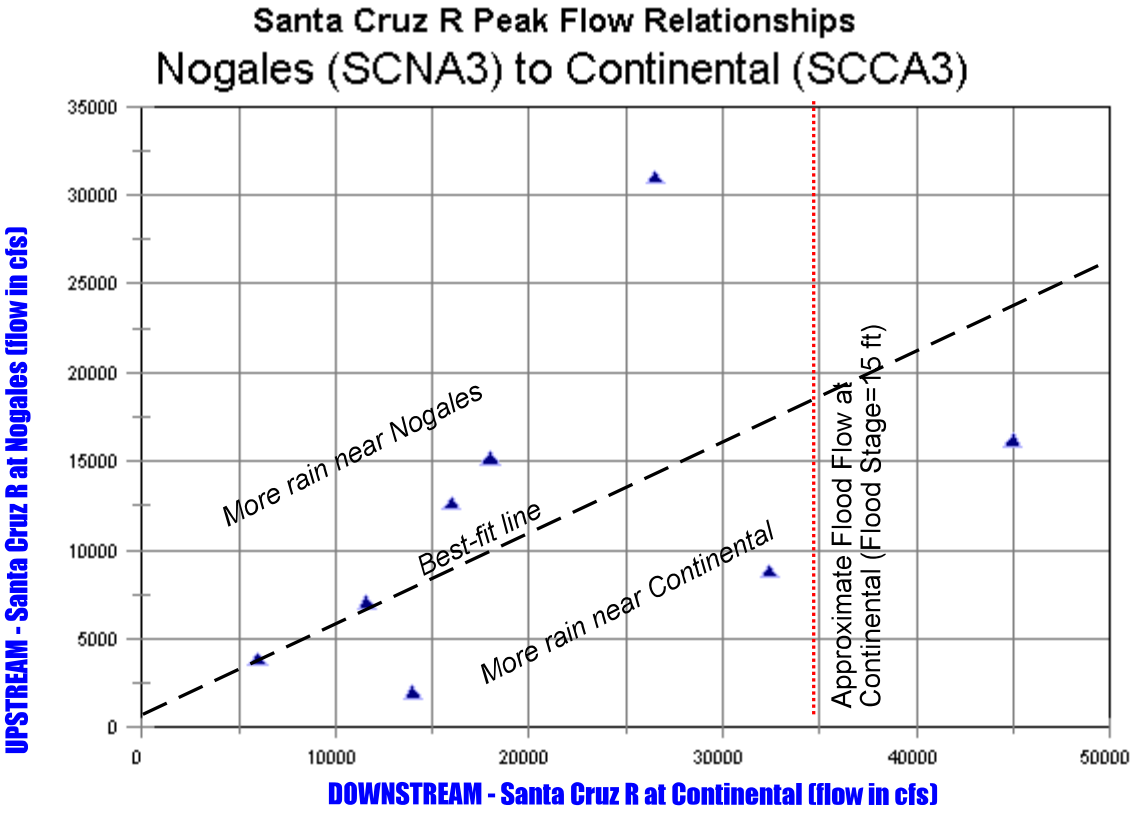
Examples

The following two pages are examples of cross plots developed for the Tucson HSA.

NWS Tucson - Hydrology Program

Peak Flow Diagram - Santa Cruz River, Nogales to Continental

The Colorado Basin RFC does not provide runoff model guidance for the Continental or Cortaro fcst points on the Santa Cruz, so these diagrams are provided as guidance for routing flows downstream. Refer to the current rating tables to convert the flow to stage for public forecasts/warnings/statements.



Estimated Travel Time for the Peak Flow from Nogales to Continental is 8 - 12 hrs.

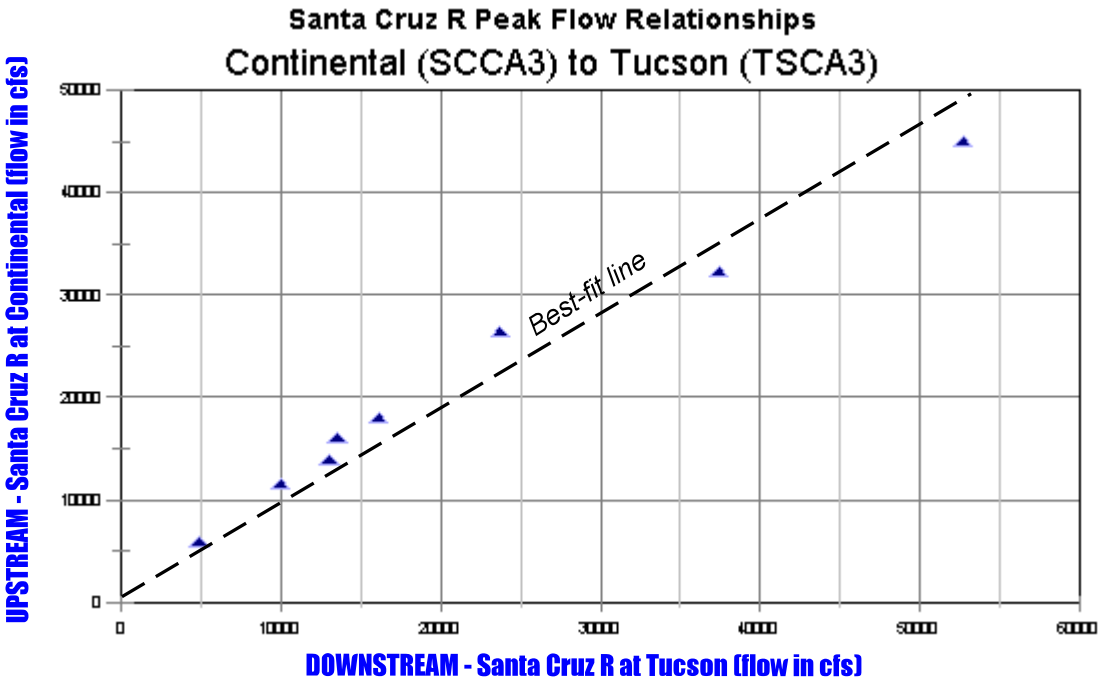
Event Date	Nogales (cfs) SCNA3	Continental (cfs) SCCA3
09/10/64	2000	14000
12/23/65	3840	5990
12/20/67	15200	18000
10/09/77	31000	26500
12/18/78	12700	16000
10/02/83	16200	45000
12/27/84	7080	11600
01/19/93	8800	32400

Santa Cruz River – Nogales (SCNA3) to Continental (SCCA3)

NWS Tucson - Hydrology Program

Peak Flow Diagram - Santa Cruz River, Continental to Tucson

The Colorado Basin RFC does not provide runoff model guidance for the Continental or Cortaro fcst points on the Santa Cruz, so these diagrams are provided as guidance for routing flows downstream. Refer to the current rating tables to convert the flow to stage for public forecasts/warnings/statements.



Estimated Travel Time for the Peak Flow from Continental to Tucson is 5 - 7 hrs.

Event Date	Continental (cfs) SCCA3	Tucson (cfs) TSCA3
09/10/64	14000	13000
12/23/65	5990	4830
12/20/67	18000	16100
10/09/77	26500	23700
12/18/78	16000	13500
10/02/83	45000	52700
12/27/84	11600	10000
01/19/93	32400	37400

Santa Cruz River – Continental to Tucson